

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Bureau of Ocean Energy Management**  
**Office of Renewable Energy Programs**

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**Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys**

**I. Introduction**

The U.S. Department of the Interior, Bureau of Ocean Energy Management (BOEM) requires an applicant to submit a Site Assessment Plan (SAP), Construction and Operations Plan (COP), or General Activities Plan (GAP), as applicable, for review prior to the approval of any renewable energy facility, structure, or cable proposed on the Outer Continental Shelf (OCS). BOEM regulations require an applicant to include the results of site characterization surveys, with supporting data, as part of a plan.

BOEM uses the results of site characterization studies submitted with a plan to evaluate the impact of proposed activities on physical, biological, and socioeconomic resources as well as the seafloor and sub-seafloor conditions that could affect the construction, installation, and operation of an offshore renewable energy device.

In compliance with 30 CFR Part 585 Subpart F, BOEM has provided recommendations for conducting and reporting the results of baseline collection studies to support the acquisition of site characterization data, in separate guidelines. These guidelines are:

- Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585;
- Guidelines for Providing Geological and Geophysical, Hazards, and Archaeological Information Pursuant to 30 CFR Part 585;
- Guidelines for Providing Fisheries Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585;
- Guidelines for Providing Benthic Habitat Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585; and
- Guidelines for Providing Marine Mammal and Sea Turtle Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585.

These guidelines may be updated periodically and a new version will supersede previous versions.

The above guidelines can be found on the web at: [http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/Index.aspx#Notices\\_to\\_Lessees,\\_Operators\\_and\\_Applicants](http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/Index.aspx#Notices_to_Lessees,_Operators_and_Applicants)

The purpose of this document, Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys, is to provide a general framework for the submission of spatial data from the site characterization surveys. They are intended to supplement the above listed guidelines by standardizing the data submission format. The collection of data related to site characterization activities includes geological, geotechnical, shallow hazards, archaeological, benthic habitat, and biological surveys. In an effort to minimize the submission of duplicative and redundant data collected during survey activities, BOEM prefers to receive one standardized dataset. In some cases the submission of multiple datasets is necessary or unavoidable; in either case this will not preclude consideration of the plans. Any questions about these guidelines may be addressed on a case-by-case basis during the pre-survey meeting as suggested in each of the survey guidelines.

## **II. Digital Map Format and Spatial Database Specifications**

The following guidelines outline the format in which BOEM requests to receive the spatial results of the site characterization activities. These specifications are suggested digital spatial data capture standards for the site characterization survey data. Digitally captured spatial data should be packaged and submitted in a standard Geographic Information Systems (GIS) format, preferably an ESRI geodatabase. Other spatial or GIS formats are also acceptable, provided they are interoperable with industry standard software. All electronic files submitted in the spatial database should be referenced to the North American Datum of 1983 (NAD 83).

Applicants are encouraged to provide the results of the overall site characterization following the specifications below:

### **A. Digital Map Format**

The submission of digital maps of data from site characterization surveys (i.e., avian, geological and geophysical, hazards, archaeological, benthic habitat, marine mammals, and fish surveys) should be consistent in format and contain similar graphical elements. Listed below are important elements that the digital maps should contain.

1. A legend which includes symbols used to depict:
  - Infrastructure (e.g., cables);
  - Biological features including live bottoms, topographic features, and chemosynthetic communities;
  - Geophysical characteristics such as acoustic voids; and
  - Other features such as unidentified magnetic anomalies and side scan sonar targets (with avoidance radii), buried channels, and shipwrecks.
2. Basemap and marginalia elements include:
  - project area;
  - map scale;
  - map title;

- company names;
- personnel names, activity dates, file and job numbers, and map numbers (e.g., map 1 of 2);
- map borders;
- north arrow;
- OCS area name(s) and block number(s);
- lease numbers;
- Federal/state boundaries;
- latitude and longitude graticules; and
- tic marks used to delineate state plane or UTM coordinates.

## B. Spatial Database Specifications

These specifications serve as a general guideline to develop the structure of the spatial database submitted to BOEM. The spatial database should contain all relevant features in the appropriate digital format (point, line, polygon, or raster). All spatial features should be attributed and contain logically named attribute fields. It is recommended that an attribute key be provided as an addendum to the spatial database. Topological rules should be established and enforced when applicable. Spatial datasets and spatial features submitted with a plan include but are not limited to:

### 1. Infrastructure Spatial Dataset

The infrastructure spatial dataset contains locations of existing and proposed infrastructure. A distinction should be made between existing infrastructure and infrastructure related to proposed renewable energy activities.

Existing infrastructure spatial features include but are not limited to:

- transmission cables;
- pipelines;
- anchorage areas;
- fairways;
- traffic separation schemes;
- precautionary/caution areas;
- removed structures; and
- existing energy facilities (liquefied natural gas (LNG), wind, tidal, wave, etc.).

Proposed infrastructure spatial features include but are not limited to:

- transmission cables;
- wind turbine location(s);
- met tower location(s);
- wave generation structures; and
- onshore support facilities.

## 2. Navigation Data and Bathymetry Spatial Dataset

The navigation data and bathymetry spatial dataset contains the post-plot of the navigation data and bathymetric data. Spatial features include but are not limited to:

- survey lines;
- shot points; and
- bathymetry data.

## 3. Seafloor Spatial Dataset

The seafloor spatial dataset contains geological features, unidentified side scan sonar targets, and magnetic anomalies located by the geophysical survey. Spatial features include but are not limited to:

- unidentified side scan sonar contacts;
- unidentified magnetic anomalies;
- magnetic contours;
- artificial reefs and artificial reef planning areas;
- seafloor fluid expulsion features and shallow gas vents;
- brine seeps and brine pools;
- seafloor scarps with height;
- mounds;
- relict reefs;
- outcrops and hard bottoms;
- sand wave habitat;
- named topographic features and their protection zones;
- areas of seafloor slumping, debris flows, mud slides, and collapse depressions;
- scour and furrows;
- natural and dredged channels; and
- other seafloor features and anomalies (e.g., shipwrecks, pockmarks, can holes).

## 4. Biological Spatial Dataset

The biological spatial dataset contains biological features and should be classified according to the Federal Geographic Data Committee's (FGDC) approved [Coastal and Marine Ecological Classification Standard \(CMECS\)](#). When attributing individual biological features, the lowest taxonomic unit using the CMECS classification standard should be used. Biological feature attribution should capture count, effort, and temporal information. Spatial features include but are not limited to:

- fish and shellfish;
- marine mammals;
- sea turtles;
- sea birds;
- benthic communities;
- plankton;
- seagrasses;
- plant life; and
- commercial and recreational fishing activities (National Marine Fisheries Service (NMFS) or historical data).

## 5. Subsurface Spatial Dataset

The subsurface spatial dataset contains subsurface features located by the geophysical survey. Spatial features include but are not limited to:

- buried faults with depth labels;
- shallow gas as seen on shallow penetration sub-bottom profiler (acoustic voids);
- shallow gas as seen on medium penetration seismic profiler or conventional seismic reflection data (2-D or 3-D) (high amplitudes, bright spots) with depth labels;
- buried slumping;
- buried hydrates (e.g., bottom simulating reflector (BSR), seismic blanking);
- shallow waterflow zones;
- salt;
- boulders, glacial till;
- significant geologic features;
- karst features; and
- relict geomorphic features (e.g., buried channel features, estuaries, embayments, beach ridge sequences, spits, alluvial terraces).

## C. Metadata

Applicants should include metadata for each spatial feature in accordance with the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) or International Standardization Organization's (ISO) 19115 metadata format.

## III. Baseline Data Resources

There are a number of baseline data resources available for public consumption. These resources contain datasets that can be used to understand existing baseline mapping efforts. They can also assist in developing context around survey data submitted to BOEM for review as part of a plan.

## National Geospatial Data Portals:

- MarineCadastre.gov is an integrated marine information system that provides ocean data, offshore planning tools, and technical support to the offshore renewable energy community. The project was designed specifically to support renewable energy siting on the U.S. Outer Continental Shelf but is also being used for other ocean-related efforts. MarineCadastre.gov has three primary focus areas: Web map viewers and ocean planning tools; spatial data registry; and technical support and regional capacity building. [www.marinecadastre.gov](http://www.marinecadastre.gov);
- National Oceanic and Atmospheric Administration (NOAA) Coastal and Marine Spatial Planning (CMSP) Data Registry is a collection of web-accessible NOAA geospatial data deemed essential for local, regional, or national-level CMSP processes. <http://cmsp.noaa.gov/index.html>;
- Data.gov Ocean Community is the National Ocean Council portal for data, information, and tools to support people engaged in planning for the future of the ocean, the coasts, and the Great Lakes. <http://www.data.gov/ocean/community/ocean>;
- OBIS (Ocean Biogeographic Information System) –USA is a program of the United States Geological Survey (USGS) Core Science Analytics and Synthesis (CSAS). It is the U.S. national node of the Ocean Biogeographic Information System (OBIS). Meant to serve research and natural resource management needs, OBIS-USA brings together marine biological occurrence data in a standard format, with metadata, web-based discovery and download, and web service access for users and applications. <http://www.usgs.gov/obis-usa/index.html>; and
- U.S. Integrated Ocean Observing System (IOOS) is an integrated and expedited access system to ocean observation data for improved decision making. The Data Management and Communication (DMAC) subsystem of U.S. IOOS serves as a central mechanism for integrating all existing and projected data sources. Data from U.S. IOOS partners, including the eleven IOOS Regional Associations and sixteen Federal agency partners, are integrated and available through the U.S. IOOS Data Catalog and Asset Viewer. <http://www.ioos.gov/data/welcome.html>.

## Regional Ocean Planning Geospatial Data Portals:

- Mid-Atlantic Regional Council on the Ocean (MARCO) Mid-Atlantic Ocean Data Portal <http://portal.midatlanticocean.org/portal/>; and
- Northeast Regional Ocean Council (NROC) Northeast Ocean Data <http://northeastoceandata.org/>.